1. (Currently Amended) A reactor assembly comprising:

a base unit;

a chuck assembly disposed in a cavity of the base unit, wherein the chuck assembly comprises a support having a surface capable of receiving a substrate;

a process chamber comprising a top wall, a bottom wall, and sidewalls extending therefrom substantially perpendicular to the support surface of said chuck assembly, and a cylindrical opening extending through the bottom wall to the top wall defining a substantially cylindrically shaped interior region having a central axis extending substantially perpendicular to the support surface of said chuck assembly , wherein the process chamber is coupled to the base unit;

an inlet manifold assembly in fluid communication with a first sidewall opening of the process chamber in a selected one of the sidewalls, wherein the inlet manifold assembly comprises a ~~triangularly shaped~~ substantially fan-shaped flow-shaping portion adapted to laterally elongate a gas and/or a reactant flow into the process chamber, wherein the fluid communication between the inlet manifold assembly and the first sidewall opening of the process chamber is free from a baffle plate; and

an exhaust manifold assembly in fluid communication with a second sidewall opening of the process chamber in the sidewall diametrically opposed from the selected one of the sidewalls, wherein the first and second sidewall openings define an entire flow path of the gas and/or the reactant flow into and out of the process chamber.

2. (Original) The reactor assembly according to Claim 1, wherein the flow-shaping portion of the inlet manifold assembly is adapted to introduce the gas and/or reactant flow into the process chamber at about a plane parallel to a surface of the substrate.

3. (Canceled)

4. (Original) The reactor assembly according to Claim 1, wherein the top wall of the process chamber is removable.

5. (Previously Presented) The reactor assembly according to Claim 1, wherein a bottom wall of the base unit is adapted to be stackedly attached to a second reactor assembly.

6. (Original) The reactor assembly according to Claim 1, wherein the exhaust manifold assembly is adapted to receive the gas and/or reactant flow from the process chamber at about a plane parallel to the surface of the substrate.

7. (Original) The reactor assembly according to Claim 1, wherein the exhaust manifold assembly comprises an exhaust receiving portion and a flow restrictor, wherein the flow restrictor is affixed to an opening of the exhaust receiving portion and is adapted to restrict the gas and/or reactant flow through the opening from the process chamber into the exhaust receiving portion.

8. (Original) The reactor assembly according to Claim 1, wherein the support of the chuck assembly comprises a means for regulating a temperature of the substrate.

9. (Original) The reactor assembly according to Claim 1, wherein the support further comprises a resistance heating element and a cooling passage.

10. (Original) The reactor assembly according to Claim 1, wherein the support of the chuck assembly is stationary and non-rotating.

11. (Original) The reactor assembly according to Claim 1, wherein the inlet manifold assembly further comprises a flow restrictor attached to an opening of the flow-shaping portion.

12. (Original) The reactor assembly according to Claim 1, wherein the top wall is substantially transparent to a light source.

13. (Original) The reactor assembly according to Claim 1, wherein the top wall is substantially transparent to a UV light source.

14. (Original) The reactor assembly according to Claim 1, wherein the top wall is substantially transparent to an infrared light source.

15. (Previously Presented) The reactor assembly according to Claim 1, wherein the process chamber includes a third sidewall opening in the sidewall adjacent to the first and second sidewall openings, wherein the third opening is sized for transporting the substrate into an interior region of the process chamber.

16. (Original) The reactor assembly according to Claim 1, further comprising a baffle plate disposed about an opening of the flow-shaping portion.

17. (Original) The reactor assembly according to Claim 7, wherein the exhaust receiving portion is triangularly shaped.

18. (Original) The reactor assembly according to Claim 7, wherein the flow restrictor comprises a plate having at least one passageway.

19. (Original) The reactor assembly according to Claim 7, wherein the flow restrictor comprises a rectangularly shaped plate having a length dimension greater than a height dimension, wherein the passageway is disposed in an area less than or equal to about one half of the height dimension.

20. (Original) The reactor assembly according to Claim 7, wherein the flow restrictor comprises anodized aluminum.

21. (Original) The reactor assembly according to Claim 1, wherein the inlet manifold assembly is adapted to introduce the gas and/or reactants at about a plane parallel to a surface of the substrate and the exhaust manifold assembly is adapted to exhaust the gas and/or reactants at about a plane parallel to a surface of the substrate.

22.-31. (Canceled)

32. (Currently Amended) A reactor assembly comprising:

a base unit;

a chuck assembly disposed in a cavity of the base unit, wherein the chuck assembly comprises a support having a surface capable of receiving a substrate;

a process chamber comprising a transparent top wall, a bottom wall, and sidewalls extending therefrom, and a cylindrical opening extending through the bottom wall to the top wall to define a substantially cylindrically shaped interior region, wherein the process chamber is coupled to the base unit;

a light source assembly in operable communication with the transparent top wall for projecting radiation into the process chamber;

an inlet manifold assembly in fluid communication with a first sidewall opening of the process chamber in a selected one of the sidewalls, wherein the inlet manifold assembly comprises a ~~triangularly-shaped~~ substantially fan-shaped flow-shaping portion adapted to laterally elongate a gas and/or a reactant flow into the process chamber, wherein the fluid communication between the inlet manifold assembly and the first sidewall opening of the process chamber is free from a baffle plate; and

an exhaust manifold assembly in fluid communication with a second sidewall opening of the process chamber in the sidewall diametrically opposed from the selected one of the sidewalls, wherein the first and second sidewall openings define an entire flow path of the gas and/or the reactant flow into and out of the process chamber.

33. (Previously Presented) The reactor assembly of Claim 32, wherein the light source assembly comprises a housing and a light source.

34. (Original) The reactor assembly of Claim 32, wherein the top wall comprises a quartz material.

35. (Original) The reactor assembly of Claim 32, wherein the exhaust manifold assembly is adapted to receive the gas and/or reactant flow from the process chamber at about a plane parallel to a surface of the substrate.

36. (Original) The reactor assembly of Claim 32, wherein the transparent top wall is removable.